



This document includes the Cover, Table of Contents, and Section 1.0 Introduction of the Draft EPA "Weather Deck Runoff Characterization Analysis Report" published in 2003. The reference number is: EPA-842-D-06-006

DRAFT

Characterization Analysis Report

Weather Deck Runoff

Cover, Table of Contents, and Section 1.0 Introduction

2003

DRAFT

CHARACTERIZATION ANALYSIS REPORT

DECK RUNOFF DISCHARGES

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1.0 INTRODUCTION

Deck runoff was defined as the precipitation, washdowns, and seawater falling on the weather deck of a vessel and discharged overboard through deck openings in 40 CFR 1700.4 (1999). A vessel intermittently produces deck runoff when water falls on or is applied to the exposed surfaces, such as weather and flight decks, superstructure, bulkheads, and the hull above the waterline of a vessel (e.g., freeboard and bulwark). Discharge constituents vary depending on the vessel's topside processes, and may include oil, grease, petroleum hydrocarbons, surfactants, cleaning compounds, glycols, solvents, salt, and particulates (e.g., soot, dirt, or metallic particles). All vessels generate deck runoff.¹

The Uniform National Discharge Standards (UNDS) deck runoff shipboard assessment team (referred to hereafter as the 'survey team') visited 13 vessels representing 9 different Navy and U.S. Coast Guard vessel classes to determine how various topside processes contribute to deck runoff within 12 nautical miles (nm) of the U.S. and territorial coastlines. The survey team, comprised of three topside equipment experts, conducted pierside and at-sea assessments to observe and document topside equipment and processes, cleaning practices, and their associated materials. In addition, the survey team solicited crew input regarding potential methods to reduce or eliminate discharge constituents.

Prior to performing the shipboard assessments, the survey team conducted a comprehensive evaluation of all vessel classes regulated by UNDS. All vessels listed in the document "*Ships Applicable to UNDS – Vessel Class Listing with Number of Vessels per Class (Active Vessels Only)*" were analyzed to determine similarities (Wenzel, et. al., 1999). The evaluation considered vessel mission, topside equipment, weather deck surface area, age, and number of vessels in each class. Based on the evaluation, each class of vessel was placed into one of nine platform categories: (1) air capable, carrier; (2) air capable, amphibious assault; (3) surface combatant; (4) auxiliary; (5) service craft; (6) towed support; (7) patrol/small craft; (8) submersible; and (9) research vessel.

The survey team developed a list of class-specific topside processes and equipment having the potential to contribute to deck runoff. All information concerning the topside processes was compiled to identify specific classes of vessels to survey; ensuring data were obtained multiple times on each topside process. A copy of the class-specific process matrix is provided in Appendix A. After compiling the list, the survey team determined that vessels representative of the towed support, submersible, and research vessel categories would not be surveyed. The rationale for this decision was: (1) these vessels do not have unique topside equipment; (2) these vessels do not perform unique maintenance processes topside; and (3) a survey of these vessels would not be expected to provide unique data. The survey team presented the survey approach to the UNDS Deck Runoff Discharge Assessment Team (DAT), comprised of representatives from the Navy (USN), U.S. Coast Guard (USCG), and the Environmental Protection Agency (EPA), and obtained their concurrence.

¹ Water from precipitation, washdowns, and seawater that falls on or is applied to exposed surfaces and accumulates in the lowest part of the vessel is classified as surface vessel bilgewater. Associated characterization analyses are presented in the Surface Vessel Bilewater Characterization Analysis Report.

In an attempt to obtain anecdotal quantitative as well as qualitative data, the survey team queried each sailor performing maintenance on topside equipment regarding the amount of materials used as well as the amount that is exposed to the environment following completion of the maintenance process. Unfortunately, responses varied significantly during the first two shipboard assessments. For example, one survey team member asked a sailor how much grease he had applied to a 5" gun chase; his response was 2 oz. The survey team then queried several sailors who were also working on the gun mount; responses ranged from 2 oz to 1 lb. Because the grease on the gun chase was exposed, the survey team was able to visually examine the gun chase and concluded that it contained approximately 1 lb of grease. These types of discrepancies occurred several times when investigating different maintenance processes. The survey team concluded that quantitative data obtained during shipboard surveys for material exposed to the environment would only be documented when a survey team member could verify the estimated amount. The survey team again presented this finding and recommendation to the UNDS Deck Runoff DAT and obtained their concurrence. To ensure the survey team could accurately estimate the amount of material exposed to the environment, they conducted laboratory tests designed to provide a visual baseline for comparison purposes. These tests were conducted at Naval Surface Warfare Center, Carderock Division (NSWCCD). The tests involved visual calibrations of liquid spills and grease dispersions. Typical grease guns were used to determine the quantity of grease that would be dispersed with one, two, or three pumps on the handle of the gun into a grease fitting. In addition, varying quantities of liquids, such as JP-5 (MIL-DTL-5624T), were spilled on deck surfaces to allow the observers to better quantify their visual assessments. The results were not exact, but this exercise provided a common baseline for all observers (Wenzel *et al.*, 2001a).

This characterization report is organized into the six main categories that contribute to deck runoff. Each category is comprised of one or more related processes that occur topside on Armed Forces vessels. Within each category, this report provides a brief explanation of the processes included in that category, summarizes the observations of the survey team; and presents the constituent contribution, where available, from each process. The report presents the performance objective, as defined in the topside management plan (TMP), and possible activities that could be performed to achieve that objective for each category. For the purposes of deck runoff, an objective describes the desired potential controls and expected results. Finally, the report provides a qualitative discussion of the constituents to be controlled by each activity.

When reviewing this characterization report, it is important to recognize the following:

- Constituents that fall to the deck from a variety of activities may become trapped in the rough deck surface (defined as crevices, corners, and other irregularities of a deck surface), even after clean up attempts, and these residuals may subsequently become entrained in washwater and/or rainfall and wash overboard within 12 nm. A field study to determine quantifiable amounts for these residual constituents was deemed impractical by the survey team and the Deck Runoff DAT. Some of the data presented in this report are estimates based on survey team observations.
- Information was obtained on each identified process until the survey team reached a consensus that enough data had been gathered to be representative of the Fleet. Once a consensus was reached, the survey team ceased gathering data related to that specific

process on subsequent shipboard assessments. For example, data on small boats were not gathered during the final assessments (LHD 1 and CV/CVN 68 Class vessels).

- The following sections summarize the observations of the survey team. However, due to individual vessel operational scenarios, maintenance requirements and practices, the observations may not be representative of all vessels in the same vessel class.
- The primary information identified for some materials is information contained in the military specification (mil spec) or the material safety data sheet (MSDS). Proprietary compound's bulk constituents therefore are listed as unknown.